What is claimed is:

1. A method for producing a thick grain-oriented electrical steel sheet with excellent properties, the method comprising;

preparing a slab comprising, by weight, 0.025 - 0.075% of C, 2.5 - 4.5% of Si, optionally one or more elements selected from the group consisting of A1, N, Mn, S, Se, Sb, B, Cu, Nb, Cr, Sn, Ti and Bi as inhibitor-forming elements, and the balance being iron and unavoidable impurities,

heating the slab to a temperature not higher than 1,300°C, hot rolling the slab to a hot-rolled sheet, optionally annealing the hot-rolled sheet,

cold rolling the hot-rolled sheet to a cold rolled sheet with a final thickness of 0.36 - 1.00 mm by a reduction ratio of not less than 80% by using a one stage cold rolling or two or more stages of cold rolling with intermediate annealing,

decarburization annealing the cold-rolled sheet for decarburization of the sheet at a temperature between 700 - 1,000°C,

treating the cold rolled sheet for nitriding by using NH_3 gas,

coating the cold rolled sheet with an annealing separation agent consisting essentially of MgO, and

annealing the cold rolled sheet for final finishing,

wherein the thick grain-oriented electrical steel sheet has a C-content of not greater than 0.0050%

by weight,

exhibits a magnetic flux density B_8 of not less than 1.83T and an average value of SF of less than 0.80, where SF is an index representing the boundary configuration characteristics of the individual sheet grains with the same area as the circle with diameter exceeding 5 mm has and is defined as

SF = (grain area x 4π)/(grain boundary length)^2,

the average value of SF being the average value of the individual SF values,

its grains of a diameter exceeding 5 mm have a crystal orientation deviation of 0.2-4 degrees in relation to that at the grain center, and the thick grain-oriented electrical steel sheet exhibits a core loss $W_{17/50}$(w/kg) of not more that 3.3 x t + 0.35.

2. The method according to claim 1, comprising:

decarburization annealing of cold-rolled sheet for 120 seconds to 250 seconds at 800°C to 900°C in an atmosphere of 25% N_2, 75% H_2 with a dew point of 60°C to 75°C; and

following said decarburization annealing, subjecting the sheet to nitriding treatment for 10 to 60 seconds at 700°C to 900°C in an atmosphere of dry NH_3 gas.

3. The method according to claim 1 wherein following decarburization annealing, the total N content of the sheet is set to 0.010 to 0.027% by weight.